Mississippi Transitional Refresher Course
12-Lead EKG Monitoring
Course Objectives

Upon completion of this course, the student will be able to:

1. Discuss indications, contraindications, advantages and disadvantages of a 12-lead EKG.
2. Explain specific situations which can cause complications with attaining a 12-lead EKG.
3. Discuss preparation of the skin before applying the electrodes.
4. Demonstrate proper electrode placement.
5. Obtain a 12-lead EKG.

Mississippi Transitional Refresher Course
12-Lead EKG Monitoring
Course Outline

Prehospital 12-lead electrocardiograms (EKGs) benefit patient care by alerting receiving physicians to potential thrombolytic candidates, by decreasing the time to inhospital thrombolytic administration, and by providing a baseline EKG for comparison.

1. INDICATIONS:
    1. Conscious stable patients presenting with:
        1. Chest pain or pressure of presumed cardiac etiology or
        2. Shortness of breath of presumed cardiac etiology
2. CONTRAINDICATIONS:
    1. Patients who have been subjected to trauma
3. PRECAUTIONS:
    1. Do not significantly delay transport to conduct test.
    2. On female patients, always place leads V3-V6 under the breast rather than on the breast.
    3. Never use the nipples as reference points for electrode location as nipple locations may vary widely.
    4. A “normal” EKG does not definitively rule out an MI nor should it be justification for nontransport.
    5. TREAT THE PATIENT
4. PROCEDURE:
    1. Whenever possible, attempt to obtain 12-lead with patient in supine position. If patient does not tolerate, place in semi-reclining or sitting position.
    2. Prep the skin and shave hair as necessary.
    3. Apply electrodes as follows and attach the appropriate lead to an electrode.

1.	Limb (extremity) Leads:	Precordial (chest) Leads:
	Right arm (RA)- Right wrist	V1- Fourth intercostal space to the right of the sternum
	Right leg (RL)- Right ankle	V2- Fourth intercostal space to the left of the sternum
	Left arm (LA)- Left wrist	V3- Directly between leads V2 and V4
	Left leg (LL)- Left ankle	V4- Fifth intercostal space at midclavicular
		V-5 Level with V4 at left anterior axillary line
		V- 6 Level with V5 at left midaxillary line

4. Secure the cable with the cable clasp to an item of the patient's clothing

5. Attempt to obtain the 12-lead while the vehicle is not moving. Ask the patient to remain motionless for 10 seconds (it is okay to breathe). Acquire and print two copies of the 12-lead EKG report.

6. If the monitor detects signal noise (such as patient motion or a disconnect electrode), the 12-lead acquisition is interrupted until noise is removed. Take appropriate action as required (such as reconnecting leads).

7. EKG interpretation should be relayed to receiving hospital during patient report. Document "obtained 12-lead EKG", on patient run report and attach one copy to report.

8. Notify receiving hospital personnel immediately upon arrival at hospital that 12-lead has been performed and leave one copy with receiving physician.

9. NOTE: Some services may have fax or telemetry capabilities.

5. SPECIAL NOTES:

1. Locating the V1 position (fourth intercostal space) is critically important because it is the reference point for locating the placement of remaining V leads. To locate the V1 position:
    1. Place your finger at the notch in the top of the sternum.

2. Move your finger slowly, downward about 1.5 inches until you feel a slight horizontal ridge or elevation. This is the “angle of Louis” where the manubrium joins the body of the sternum.

3. Locate second intercostal space on the right side, lateral to and just below the angle of Louis.

4. Move your fingers down two more intercostal spaces to the fourth intercostal space, which is the V1 position.

Mississippi Transitional Refresher Course
Automatic Transport Ventilators (ATV)
Course Objectives

Upon completion of this course, the student will be able to:

1. Explain primary objective of airway maintenance.

2. Explain the mechanics of respiration.

3. Describe the anatomy and function of the upper and lower airway structures.

4. Explain difference between adult and pediatric airway anatomy.

5. Describe indications, contraindications, equipment, procedure, and precautions for ventilating a patient with ATV.

6. Compare ventilation techniques used for an adult to those used for a pediatric.

7. Be familiar with equipment and techniques of using equipment.

8. Demonstrate ventilating a mannikin using an ATV.

Mississippi Transitional Refresher Course
Automatic Transport Ventilators (ATV)
Course Outline

There are several time-cycled, gas-powered ATV's available for field use or intrahospital transport when caring for patients who require ventilatory support. These lightweight, compact devices are designed for convenience and easy use during patient care and transport. They have been proven superior to bag-valve devices in maintaining minute volume. The compact ventilator usually comes with two controls: One for the ventilatory rate and the other for tidal volume. It is equipped with a standard 15 mm ID/22 mm OD adapter, so that it can be attached to a variety of airway devices.

1. INDICATIONS:

    1. Patients that are apneic or exhibiting agonal respirations requiring ventilatory support, after a Paramedic has established and secured the airway with either a nasal or oral tracheal tube.

    2. ATV's may be used on patients in full arrest.

    3. To use on pediatrics the ATV must be approved for use on pediatric patients.

2. CONTRAINDICATIONS:

    1. Patients with suspected pneumothorax/tension pneumothorax.

3. EQUIPMENT:

    1. Approved ATP
    2. Oxygen source
    3. Bag-valve device
    4. Intubation equipment
    5. End-tidal CO2 detector (if patient has pulses)

4. PRECAUTIONS:

    1. Paramedic is responsible for all airway management and must frequently reassess endotracheal tube placement. Bilateral breath sounds are to be checked after each patient movement (e.g., placing on stretcher, moving patient to ambulance, loading patient into ambulance, etc.)

5. PROCEDURE:

    1. Determine need for ventilations or assisted ventilations.

2. Establish airway and employ conventional BLS airway adjuncts and ventilaory support according to protocol.

3. Paramedic shall perform oral or nasal intubation according to appropriate protocol. Tube shall be secured and proper placement shall be confirmed using a bag-valve device conventional assessment methods.

4. End-tidal CO2 detector shall be used if patient has pulses.

5. Assemble components of automated ventilator and insure proper working order, including pressure limit alarm.

6. Determine proper Tidal Volume for patient. Use the following equation for adult and pediatric patients: 10 ml X weight in Kilograms = Tidal Volume (10ml/kg).

7. Set the Tidal Volume on the ventilator's control module accordingly.

8. Set desired breaths per minute on the ventilator's control module.

    1. Adult (12-15 per minute) Pediatric (20-24 per minute)

9. Remove bag-valve device and attach the outlet port of the ventilator assembly to the endotracheal tube.

10. Observe chest rise during the ventilation cycles. Chest rise should appear normal and symmetrical. Personnel shall continue to monitor chest rise throughout the remainder of patient care, as is done normally using a bag-valve device.

11. Personnel shall monitor PSI level is oxygen cylinder.

6. SPECIAL INFORMATION:

1. Agencies using this equipment must be certain to follow the manufacturer's instructions to the letter regarding the use, maintenance, cleaning, and regular testing of the devices.

    1. The units must be disinfected, inspected, and tested after every patient use.

    2. The units shall undergo preventive testing and maintenance by qualified personnel annually.

    3. Agencies shall arrange for (at least) annual inspections and testing of the equipment by a manufactuer's representative (or designee). Documentation of this shall be maintained in a service-log. This record shall be kept by each agency using ATV's.

2. Agency personnel must be throughly trained and regularly re-trained in the

device's use.

3. Such training shall occur annually and shall be throughly documented.

4. Agency personnel shall continually observe the patient and document patient response to any changes while the device is operational. Personnel shall chart the initial settings (rate/tidal column), and any subsequent changes, when the device is utilized. Such documentation shall appear on the patient care report.

5. KNOW YOUR EQUIPMENT

6. Additional reading: JAMA Supplement, October 28, 1992-Vol. 268, No. 16.

Mississippi Transitional Refresher Course
End-Tidal CO2 Detector-Capnography
Course Objectives

Upon completion of this course, the student will be able to:

1. **Discuss the different types of equipment.**
2. **Discuss indications, precautions, and advantages of using ETCO2 detector.**
3. **Explain how the ETCO2 detector functions.**
4. **Discuss circumstances that could produce false readings.**
5. **Discuss the color changes and their indications.**
6. **Perform an end-tidal CO2 detection.**

Mississippi Transitional Refresher Course
End-Tidal Carbon Dioxide Detection
Course Outline

Carbon dioxide (CO_2) is a byproduct of respiration. Approximately 5% of the exhaled air of a healthy patient is carbon dioxide. End-tidal CO_2 ($ETCO_2$) detection devices are useful in identifying the correct placement of a Combitube or endotracheal (ET) tube. The Easy Cap CO_2 detector is a disposable chemical indicator that can be used for up to three hours. It works by detecting $ETCO_2$ on the following color scale:

Range A (purple): <0.5% $ETCO_2$
Range B (tan): 0.5 - 2.0% $ETCO_2$
Rance C (yellow): >2.0% $ETCO_2$

1. INDICATIONS:

    1. To assist in determining correct ET tube or Combitube placement.

2. PRECAUTIONS:

    1. In low perfusion states, such as cardiac arrest, the production of CO_2 is significantly diminished and therefore, dramatic color changes may not be evident. In these cases, if the detector remains purple, reassessment of other correct tube placement is crucial.

    2. $ETCO_2$ detectors should always be used in conjunction with other assessments such as lung sounds, chest rise, ET tube locator, absence os gastric sounds, tube fogging, pulse oximetry, syringe aspiration technique, and direct visualization (in the case of ET intubation). Never entirely on $ETCO_2$ detection as the sole method of assessment for tube placement.

    3. Circumstances that could produce false readings:

        1. A patient who has received mouth to mouth ventilation may exhibit false positive readings.

        2. A patient that has recently consumed carbonated beverages may cause a false positive reading if ventilation is attempted through a tube placed in the esophagus.

3. PROCEDURE:

    1. Perform Combitube or ET intubation per guideline.
    2. Assess tube placement by using TubeChek, listening for lung sounds. Gastric

sounds, and looking for chest rise.

3. After 6-7 ventilations, place the Easy Cap device on the ET tube (or the appropriate ventilation port of the Combitube) and continue ventilating the patient. If placement is correct, the device should change color from purple to tan (or possibly yellow) with each ventilation. A color change is a positive indication of correct tube placement.

4. If the color does not change, and other assessment indicators are positive or questionable for correct tube placement, **IMMEDIATELY USE DIRECT VISUALIZATION TO DETERMINE TUBE POSITION. REMOVE ANY TUBE WHOSE POSITION CANNOT BE CONFIRMED**.

5. The ETCO2 detector should be removed after placement has been confirmed, but may be used again to reassess tube placement. This is a single patient use device.

6. Document results of ETCO2 detection.

4. PEDIATRIC CONSIDERATION:

1. The Pedi-Cap ETCO2 detector should be used on patients 1-15 kg.

Mississippi Transitional Refresher Course
CPAP/BIPAP
Course Objectives

Upon completion of this course, the student will be able to:

1. Discuss indications, contraindications, advantages and procedures of using CPAP/BIPAP.

2. Explain how CPAP/BIPAP functions.

Mississippi Transitional Refresher Course
CPAP-Continuous Positive Airway Pressure
BIPAP-Bi-Level Positive Airway Pressure
Course Outline

CPAP is prescribed for the management of sleep apnea syndrome and some related sleep-disordered breathing disorders. CPAP is the treatment of choice for most people with obstructive and mixed apnea. CPAP treatment blows air into your nose to keep your airway from collapsing. Snoring and sleep apnea are problems with breathing that take place during sleep. By increasing the air pressure in your airway, CPAP treatment keeps your airway from becoming blocked or obstructed while sleeping.

BIPAP is a variation on CPAP. Instead of providing air at a constant, steady pressure all night, the machine "senses" if you are breathing in or out and varies its level of pressure accordingly.

1. INDICATIONS:

    1. Sleep apnea

2. CONTRAINDICATIONS:

    1. Pneumothorax
    2. Pathologically low B/P
    3. Severe cardiac arrhythmias and coronary artery disease
    4. Seizures
    5. Bullous lung disease

3. COMPLICATIONS:

    1. Possible pneumocephalus with following conditions:

        1. Cerebral spinal fluid leaks
        2. Abnormalities of cribriform plate
        3. Prior history of head trauma

4. PROCEDURE:

    1. The patient will receive instructions on setting up equipment, fitting the mask for their use, maintenance and care of the equipment.

    2. With the mask fitted, the patient will settle down in bed and adjust the tubing so it is free to move with them if turning while asleep. They should not leave any long lengths of tubing around the top of the bed or pillow which could twist around their head or neck while asleep. Some patients prefer to bring tubing over the

headboard to reduce drag on the mask. Some will run it over their shoulder onto the floor.

3. The patient will push the START button, to start the flow generator. The pressure will rise quickly to the set pressure (the CPAP level prescribed by the physician. The pressure strip light display will show when the patient reaches their set pressure.

4. The patient will check mask again to make sure that the cushion fits just firmly enough that there are no leaks under CPAP conditions.

5. Patients may choose the Delay Time option to gradually build up air pressure, from a more comfortable level to the prescribed setting over a period of time.

6. Patients are able to get out of bed during the night, they will follow physician's advise as to remove mask and turn machine off, or disconnect mask and turn machine off. When returning to bed they will reconnect and restart the generator.

7. Patients are instructed to consult their physicians immediately if they develop any unexplained or unexpected symptoms. These symptoms include:

    1. Headache
    2. Respiratory infection
    3. Chest pain
    4. Feeling of distention of the stomach
    5. Middle ear or sinus discomfort
    6. Dryness of the nose, mouth or throat
    7. Air continually leaking out of the mouth while sleeping

8. Document patients use of CPAP or BIPAP, and report to hospital.

Mississippi Transitional Refresher Course
Gastric Decompression
Course Objectives

Upon completion of this course, the student will be able to:

1. Discuss the pathophysiology of gastric distention and the causes.

2. Discuss indication, contraindications, advantages and disadvantages of gastric decompression.

3. Describe the management of the patient.

4. Demonstrate gastric decompression on a manikin.

Mississippi Transitional Refresher Course
Gastric Decompression
Course Outline

Gastric distention results from air being trapped in the stomach. As the stomach diameter increases from the trapped air, it pushes against the diaphragm and interferes with lung expansion. When the abdomen becomes increasingly distended, resistance may be felt with ventilations.

1. MANAGEMENT:

    1. Place patient in left lateral recumbent position and manual pressure should be applied to the epigastric region.

    2. If the distention cannot be managed with noninvasive techniques you may need to insert a gastric tube.

2. CONTRAINDICATIONS:

    1. Esophageal obstruction
    2. Facial trauma
    3. Esophageal varcies
    4. Esophageal trauma

3. COMPLICATIONS:

    1. Nausea and vomiting

    2. Interference with mask seals and visualization of airway structures during intubation

    3. Nasal, esophageal, or gastric trauma

    4. Tracheal placement

    5. Supragastric placement

    6. Gastric tube obstruction

4. EQUIPMENT

    1. BSI
    2. Gastric tube
    3. 50 ml irrigation syringe

4. Water-soluble lubricant
5. Adhesive tape
6. Saline for irrigation
7. Pad or towel to protect patient
8. Emesis basin

5. PROCEDURE: NASOGASTRIC INSERTION

1. BSI

2. Assess the need for gastric tube

3. Assemble equipment

4. Explain procedure to patient

5. Position patient, lying or sitting if conscious

6. Look at nose for deformity or obstruction, and determine best side for insertion

7. Measure tube from patients earlobe to the tip of the nose. Then measure from the tip of the nose to the xyphoid process.

8. Mark the spot of combined measurements with a piece of tape.

9. Lubricate the tip of the tubing for 6 to 8 inches to reduce friction and irritation.

10. Place emesis basin close to the patient or allow patient to hold it.

11. Insert the tube gently through the selected nostril and gently advance toward the posterior nasopharynx. It is easiest if you direct the tube toward the patient's ear.

12. When you feel the tube at the nasopharyngeal junction, rotate it 180 degrees inward toward the other nostril. Gently advance the tube until it is in the nasopharynx.

13. As the tube enters the oropharynx, instruct the patient to swallow, continue to advance the tube each time the patient swallows, until the tape mark on the tube is at the patient's nostril.

14. If there are signs of distress such as gasping, coughing, or cyanosis, immediately withdraw the tube, as this can indicate placement in the trachea.

15. Assess for tube placement:

    1. Connect a barrel syringe to the end of the tube and aspirate stomach

contents or

2. Connect a syringe with 30 cc of air to the end of the tube, place a stethoscope over the epigastrium and inject the air. Listen for sounds of air entering the stomach.

16. Tape the tubing securely to the nose, forehead or cheek.

17. Document procedure:

1. Size of tube
2. Degree of difficulty
3. Tube placement checked
4. Any complications, such as bleeding or vomiting
5. If procedure was beneficial of relieving gastric distention

Mississippi Transitional Refresher Course
Gastric Tube Insertion
Course Objectives

Upon completion of this course, the student will be able to:

1. Identify specific anatomy of the upper airway and upper GI system as it relates to insertion of a gastric tube.

2. Discuss indication, contraindications, advantages and disadvantages for insertion of a gastric tube.

3. List equipment necessary for insertion of a gastric tube.

4. Explain the steps of nasogastric and orogastric tube insertion.

5. Discuss complications of nasogastric and orogastric tube insertion.

6. Demonstrate proper technique of nasogastric and orogastric tube insertion.

7. Check for correct placement of tube.

Mississippi Transitional Refresher Course
Gastric Tube Insertion
Course Outline

Gastric tubes are inserted through the mouth or nose, and allow direct access to the stomach for feeding or suctioning. They are also used in emergencies for evacuation of poisons from the GI tract to "pump the stomach." This process may be done on conscious or unconscious patients.

1. INDICATIONS

    1. Evacuation of stomach contents

    2. Dilute or lavage ingested poisons or to remove blood when patient has gastrointestinal hemorrhage.

2. CONTRAINDICATIONS

    1. Facial trauma
    2. Possible epiglottitis or croup
    3. Facial or esophageal trauma
    4. Esophageal varices

3. COMPLICATIONS:

    1. Nausea and vomiting

    2. Nasal, esophageal, or gastric trauma

    3. Tracheal placement

    4. Supragastric placement

    5. Gastric tube obstruction

    6. Interference with mask seals and visualization of airway structures during intubation

    7. Coiling of the tube in the posterior pharynx

    8. Passage of the tube intracranially (with cribriform plate fractures)

4. EQUIPMENT

    1. BSI

2. Gastric tube (large enough to evacuate desired material)
3. 50 ml irrigation syringe
4. Water-soluble lubricant
5. Adhesive tape
6. Saline for irrigation
7. Pad or towel to protect patient
8. Emesis basin
9. Intermittent suction equipment

5. PROCEDURE: NASOGASTRIC INSERTION

1. BSI

2. Assess the need for gastric tube

3. Assemble equipment

4. Explain procedure to patient

5. Position patient, lying or high Fowler's if conscious

6. Look at nose for deformity or obstruction, and determine best side for insertion

7. Measure tube from patients earlobe to the tip of the nose. Then measure from the tip of the nose to the xyphoid process.

8. Mark the spot of combined measurements with a piece of tape.

9. Lubricate the tip of the tubing for 6 to 8 inches to reduce friction and irritation.

10. Place emesis basin close to the patient or allow patient to hold it.

11. Insert the tube gently through the selected nostril and gently advance toward the posterior nasopharynx. It is easiest if you direct the tube toward the patient's ear.When you feel the tube at the nasopharyngeal junction, rotate it 180 degrees inward toward the other nostril. Gently advance the tube until it is in the nasopharynx. As the tube enters the oropharynx, instruct the patient to swallow, continue to advance the tube each time the patient swallows, until the tape mark on the tube is at the patient's nostril.

12. If there are signs of distress such as gasping, coughing, or cyanosis, immediately withdraw the tube, as this can indicate placement in the trachea.

13. Assess for tube placement:

    1. Connect a barrel syringe to the end of the tube and aspirate stomach

contents or

2. Connect a syringe with 30 cc of air to the end of the tube, place a stethoscope over the epigastrium and inject the air. Listen for sounds of air entering the stomach.

14. Tape the tubing securely to the nose, forehead or cheek.

15. Lavage stomach contents by injecting 100 mL to 150 mL boluses of normal saline into the tube and allowing the return of gastric contents by aspiration or intermittent suction.

16. Document procedure:

    1. Size of tube
    2. Degree of difficulty
    3. Tube placement checked
    4. Any complications, such as bleeding or vomiting
    5. Amount of fluid infused and returned

Mississippi Transitional Refresher Course
Needle Chest Decompression
Course Objectives

Upon completion of this course, the student will be able to:

1. Discuss specific anatomic structures for needle decompression.

2. Discuss indications, contraindications, advantages and disadvantages of needle decompression.

3. Discuss complications of needle decompression.

4. Assemble appropriate equipment for needle decompression.

5. Demonstrate proper needle decompression technique on a manikin.

Mississippi Transitional Refresher Course
Needle Chest Decompression
Course Outline

Needle decompression of the chest should be restricted to rapidly deteriorating patients. This procedure is placement of a needle through the chest wall of a patient whose lung has collapsed as a result of a one-way valve air leak. Some common causes of tension pneumothorax:

- Mechanical ventilation
- Spontaneous pneumothorax from ruptured emphysematous blebs
- Chest trauma, blunt or penetrating
- Fractured rib(s) or flail sternum secondary to chest compressions

1. INDICATIONS:

    1. Thoracic decompression is indicated in patients with clinical signs and symptoms consistent with tension pneumothorax, clinical signs are;

        1. restlessness and agitation

        2. increased airway resistance on ventilating

        3. neck vein distention

        4. respiratory distress--severe dyspnea, tachypnea, air hunger in the conscious patient

        5. unilateral absence of breath sounds on affected side

        6. hyperresonance to percussion on affected side

        7. hypotension

        8. cyanosis

        9. tracheal deviation toward unaffected side

        10. respiratory arrest

2. CONTRAINDICATIONS:

    1. There are no contraindications for patients meeting the above criteria.

3. COMPLICATIONS: (possible)

1. If a pneumothorax is not present, opening the pleural space will complicate the patient's condition by causing a pneumonthorax in 10% to 20% of cases

2. Placing the needle to high or too anterior in the chest may injure a vessel (subclavian artery or vein) or the heart.

3. Attempts to vent the chest below the 5th intercostal space may result in trauma to the liver or the spleen.

4. EQUIPMENT:

1. Large-bore over-the-needle catheter (14-gauge or larger)
2. 10-cc syringe
3. Povidone-iodine preps
4. Finger cut from a sterile glove for flutter valve
5. Sterile dressing
6. Sterile gloves
7. (McSwain Dart is used in some systems)

5. PROCEDURE:

1. Observe body substance isolation precautions

2. Locate the landmark for decompression on the affected side.

3. Clean site povidone-iodine swabs

4. Attach a 10-cc syringe to a 14-gauge or larger over-the-needle catheter. Puncture the skin perpendicularly just superior to the third rib (second intercostal space) in the midclavicular line (approximately in line with the nipple) until the thoracic cavity is entered. The fifth intercostal space in the mid-axillary line is an alternate site.

5. On entering the thoracic cavity with a tension pneumothorax, you should feel a pop, and then, depending on the level of ambient noise , you may hear a "hiss" as air is decompressed. Alternately, you may see the plunger of the syringe push outward.

6. Advance the catheter and remove the needle.

7. A Heimlich valve or the finger cut from a surgical glove may be used to create a one-way valve allowing air to escape, but not enter, the chest. Place a finger from a surgical glove over the catheter hub. Cut a small hole in the end of the finger to make a one-way or flutter valve. Secure the glove finger to the catheter, using tape or a rubber band. The flutter valve collapses during inspiration and

opens during expiration. In some EMS systems a heimlich valve is used in place of the surgical glove finger.

8. Secure the catheter to the chest wall with a dressing and tape.

9. Document procedure.

Mississippi Transitional Refresher Course
Needle Cricothyroidotomy
Course Objectives

Upon completion of this course, the student will be able to:

1. Identify anatomic structures of airway when given an unlabeled diagram.
2. 2. List indications and contraindications and of needle cricothyroidotomy.
3. 3. List complications of needle cricothyroidotomy.
4. Identify and list equipment needed to perform a needle cricothyroidotomy.
5. Discuss the need for aseptic technique.
6. Demonstrate needle cricothyroidotomy on manikin.

Mississippi Transitional Refresher Course
Percutaneous Transtracheal Ventilation
(Needle Cricothyroidotomy)
Course Outline

PTV involves the insertion of a catheter through the cricothyroid membrane. The catheter is then connected to a high-pressure oxygen source, and oxygen is delivered intermittently into the trachea. Cricothyroidotomy is a surgical procedure and requires training before it can be preformed. In situations where endotracheal intubation is not possible, PTV is an alternative.

1. INDICATIONS:

    1. The only indication for cricothyroidotomy is the inability to secure an airway by other procedures such as endotracheal intubations (e.g., cervical spine trauma, maxillofacial trauma; and oropharngeal obstruction caused by foreign body, masses, infections (epiglottitis), or edema resulting from allergic reactions or inhalation injury.

2. CONTRAINDICATIONS:

    1. Possibility of establishing an easier and less invasive airway rapidly.

    2. Acute laryngeal disorders such as laryngeal fractures that cause distortion or obliteration of landmarks (e.g., children under 10 years of age, bleeding disorders, injury or obstruction below the level of the cricothyroid membrane).

    3. Obstruction above the level of the vocal cords, because air will not be able to escape during exhalation.

3. COMPLICATION:

    1. Pneumothorax
    2. Pneumomediastinum
    3. Subcutaneous emphysema
    4. Catheter dislodgement
    5. Hemorrhage
    6. Esophageal or mediastinal injury
    7. Hypercarbia

4. EQUIPMENT:

    1. 14-gauge or larger over-the-needle catheter, 21/4 inches long

    2. 10cc syringe

3. Three-way stopcock

4. Two standard oxygen tubings, 4 to 5 feet each

5. Y-connector

6. Oxygen cylinder coupled with 50-psi step-down regulator and needle flow meter(e.g., Bourdon-type flow gauge and regulator).

7. Povidine-iodine swabs

8. Adhesive tape

9. Suction equipment

10. Gloves

11. Goggles

5. PROCEDURE:

1. Observe body substance isolation precautions

2. Palpate the thyroid cartilage, cricothyroid membrane, and suprasternal notch.

3. Prep the skin with two povidone-iodine swabs

4. You may attach the syringe to the over-the-needle catheter, or you may elect to use the catheter-needle assembly by itself. This is a personal perference, some think that using a syringe makes the unit less stable. Puncture the skin over the cricothyroid membrane.

5. Advance the needle at a 45-degree angle caudally (toward the feet).

6. Carefully push the needle until it “pops” into the trachea (aspirating on the syringe as you advance the needle, if using a syringe).

7. Free movement of air confirms that you are in the trachea.

8. Advance the plastic catheter over the needle, holding the needle stationary, until the catheter hub comes to rest against the skin.

9. Holding the catheter securely, remove the needle.

10. Reconfirm the position of the catheter. Securely tape the catheter to the skin.
11. Attach the three-way stopcock to the catheter hub. Connect one end of the

oxygen tubing to the stopcock.

12. Connect the other end of the oxygen tubing to the Y-connector. Attach the second oxygen tubing to the other arm of the Y-connector. This tubing is then connected to the flowmeter on the oxygen cylinder. These connections should be made before the procedure to save time.

13. To ventilate the patient, open the regulator and set it at maximum rate (greater than 15L/min). Occlude the third arm of the Y-connector with your thumb. Air will then flow into the lungs. When you release the occlusion on the Y-connector, air flow will be diverted outward, allowing the lungs to recoil and collapse. By alternately occluding and releasing thumb pressure on the connector (1 second on and 4 seconds off), you can maintain adequate ventilation for approximately 30 minutes.

14. Constantly monitor the patient's breath sounds, ventilation status and color. Adequate exhalation never fully occurs with this technique. The patient may develop hypercarbia (increased CO2) and increased air pressure in the lungs, possibly causing the alveoli to rupture.

15. Document procedure.

6. **Alternative to Jet Ventilation:**

1. Insert large bore catheter (14gauge or larger) through cricothyroid membrane as described above.

2. Attach the plastic adapter from a 3.5 ETT to the hub of the catheter.

3. Fit a BVM unit to the adapter and ventilate using the bag. Allow enough time for exhalation through the small caliber catheter.

Mississippi Transitional Refresher Course
Peak Expiratory Flow Meter
Course Objectives

Upon completion of this course, the student will be able to:

1. Discuss indications, advantages and disadvantages of using peak expiratory flow meter.

2. Explain how this equipment works.

3. Paramedic will understand the significance of peak expiratory flow meter color zones.

Mississippi Transitional Refresher Course
Peak Expiratory Flow Meter
Course Outline

A peak flow meter is a simple, handheld device that helps the patient to monitor and predict asthma flare-ups. It is not unusual for patients with asthma to have a poor awareness of their disease or to misjudge the severity of their symptoms. Peak expiratory flow rate provides a simple, quantitative measure of airflow obstruction which can be performed in the home, school, workplace or office for a quick measure of lung function. It is important that patients understand the need to perform this on a regular basis.

1. INDICATIONS:

    1. Asthma
    2. Emphysema
    3. Chronic Bronchitis

2. PROCEDURE: Have the patient to:

    1. Place the indicator at the base of the numbered scale.

    2. Stand up.

    3. Take a deep breath.

    4. Place the meter in the mouth and close lips around the mouthpiece.

    5. Blow out as hard and fast as possible, similar to the amount of effort to blow up a balloon.

    6. Write down the achieved measurement or value.

    7. Repeat the process two more times.

    8. Record the highest of the three numbers achieved.

There are three color-coded zone management areas. These color zones are based on the patient's best peak flow measurement, or the patient's personal best, the highest peak flow measurement the patient can reach consistently when under control. The patient needs to use the peak flow meter twice a day for at least two weeks to establish a personal best.

    9. **Green Zone: (Safety)**
    (80 to 100% of the patients personal best)
    Readings in this zone mean GO ahead with regular activities. They are to follow

their regular medication plan.

10. **Yellow Zone: (Caution)**
50 to 80% of patient's personal best)
These readings mean CAUTION, the patient may be experiencing as asthma flare-up and will need to follow their doctor's medication instructions to get back into the green zone.

11. **Red Zone: (Danger)**
(below 50% of patient's personal best)
If the readings are in this zone, STOP and get medical advice and attention immediately.

3. PREHOSPITAL CARE:

The paramedic may consider any patient in the red zone at risk for respiratory compromise.

Mississippi Transitional Refresher Course
Pulse Oximetry
Course Objectives

Upon completion of this course, the student will be able to:

1. Discuss indications, precautions, and pediatric considerations of using pulse oximetry.

2. Compare normal vs abnormal SaO2 ranges.

3. Discuss circumstances that could produce false readings.

4. Perform pulse oximetry reading.